Part 2: Bug Variations

Do You Know?

Set 2

The source code for the BoxBug class can be found in the boxBug directory.

1. What is the role of the instance variable sideLength?

   The sideLength defines the number of steps that the BoxBug can move on each side of the box.

2. What is the role of the instance variable steps?

   The steps records how many steps a BoxBug has move on each side of the box.

3. Why is the turn method called twice when steps becomes equal to sideLength?

   When the BoxBug bug has move sideLight steps, the bug need to turn 90 degrees to start the next side. But the turn method can only has 45 degrees turn, so we should call the turn method twice, that is 90 degrees(45 * 2 = 90).

4. Why can the move method be called in the BoxBug class when there is no move method in the BoxBug code?

   The BoxBug class is extends the Bug class, and the Bug class has a method move. So BoxBug inherits the move method from Bug.

5. After a BoxBug is constructed, will the size of its square pattern always be the same? Why or why not?

   Yes. The side length is assigned in the constructors function. When BoxBug is constructed, the side length is determined.

6. Can the path a BoxBug travels ever change? Why or why not?

   Yes. If there is a Rock, Bug, Actor or Border in front of the bug, it will turn and start a new path.

7. When will the value of steps be zero?

   The time when construct a BoxBug instance and when the variable path is equal to sideLength.

Exercises

1. The bug turn 45 degrees in each side, so the path of the CircleBug is an regular octagon.
5. (1) BoxBug boxbug = new BoxBug(length);
   (2) world.add(new Location(a, b), boxbug); or
   world.add(boxbug);